

To: The Federal Communications Commission  
June 16, 2002

In regards to the proposed approval of iBiquity's In-Band, On-Channel (IBOC) Digital Audio Broadcasting (DAB) system, there are many issues that need to be addressed before any new broadcasting format can be authorized for use on the AM or FM radio bands. In this case, IBOC DAB is especially questionable in that if approved, the United States of America would be the only country using it. The standards for analog AM and FM broadcasting have largely been standardized, and even if differing frequency allocations are used, the methods for broadcasting analog AM and FM radio, including the methods for AM Stereo and FM Stereo, are an international standard.

The difference in this case is that many other countries are pursuing the use of other digital broadcasting systems, including DRM (Digital Radio Mondial) and "Eureka 147" DAB on the "L-band" frequency range (separate from AM and FM). As of yet, the USA is the only country to show interest in the IBOC method of Digital Audio broadcasting. Even Canada has shown no significant interest in IBOC DAB, and instead is choosing to use the L-band DAB system, with station already operational and following the same format as the DAB stations that are popular in Europe.

As for judging IBOC DAB based on its own merits, the results of this have been published and it cannot be denied that its performance on both the AM and FM bands leaves much to be desired. On FM, the major factor is interference to adjacent channels, something I have personally observed while listening to the tests of IBOC DAB on New York City station 102.7 WNEW-FM. On AM, the adjacent channel interference problem is even more significant, hindering its performance to the point where the NRSC has deemed IBOC DAB unsuitable for nighttime use on the AM band.

And at the same time, IBOC DAB on AM has another bandwidth problem in the opposite direction, in that it mandates a limitation of the station's analog audio frequency response to less than 5 kHz -- half of the current NRSC standard of 10 kHz audio bandwidth. Considering that an average telephone has an audio response of about 3 kHz, this may be acceptable for voice, but does not offer nearly enough fidelity for the enjoyment of music, and also significantly reduces the high frequency sibilants which make human voice more clear, understandable, and life-like. It is true that many AM radios have a disappointingly narrow audio bandwidth which does not allow AM's current audio response of 10 kHz to be fully enjoyed, but imposing a limitation of less than 5 kHz is a difference that can be instantly noticed even on a typical AM radio with poor audio fidelity.

Instead of the complex, expensive, unproven, and non-standard IBOC DAB system with its questionable performance, the ideal choice for promoting higher quality AM radio has already existed for nearly a decade. It is the "AMAX" receiver quality standard, introduced in the early 1990s as a joint venture between the EIA and NAB and approved by the NRSC to be the ideal match to the quality standards for AM radio stations that were introduced at that time. AMAX provides the highest possible fidelity available with existing well-proven analog AM technology, and also incorporates methods that improve reception and

reduce interference under a wide variety of signal conditions, ranging from strong local daytime stations, to weak, distant nighttime "skywave" signals.

AMAX also makes use of the Motorola C-Quam AM Stereo system, now in use for over 20 years, for the highest possible audio fidelity available from any AM broadcasting service currently in use throughout the world. C-Quam AM Stereo is an international standard, used by hundreds of stations around the world and supported by millions of receivers that have been manufactured since the early 1980s. This is in comparison to IBOC DAB which would have no installed base of support and would require the purchase of all new transmitting and receiving equipment, a considerable expense laden with the concern that the money would be wasted if IBOC DAB becomes a failure.

AMAX AM Stereo have also benefitted from the ideal use of digital technology in radio reception -- strictly in the receiver, so that a robust and fully-compatible analog signal can be transmitted and then transformed into digital mode within the receiver, where advanced Digital Signal Processing (DSP) can be applied to it to significantly improve reception and audio quality. DSP is already in use in radios for both the AM and FM bands and the results are excellent. It allows AM Stereo (meeting the AMAX standard) to be subjectively equivalent to the quality of FM Stereo, or actually superior in some cases due to the enhanced Stereo imaging that AM Stereo provides. DSP also nearly eliminates the typical problems with FM, such as multipath, background hiss, and poor Stereo quality on weak signals.

There is no doubt that the intentions of IBOC DAB are genuine -- to provide higher quality radio listening on both the AM and FM bands, something which radio listeners have wanted for decades. However, the serious question the FCC needs to decide is if existing technologies such as AMAX AM Stereo and DSP are sufficient to provide this benefit without the added expense, complexity, and uncertainty of fully digital systems like IBOC DAB.

This is important on many levels because radio as we know it today is the most common and inexpensive form of communication available to the people throughout the world. Analog AM radio has now been in use for over 80 years, with an unsurpassed level of availability, which is especially important in emergency situations where a simple AM transistor radio is the most basic and most reliable method of bringing potentially life-saving information to the public. In their current forms, receivers for any digital radio system such as IBOC DAB, Eureka 147 DAB, or XM or Sirius satellite radio, are all too complex and power-hungry to be made into a receiver that can fit in the palm of your hand and run for months on a set of regular alkaline batteries. All radio systems need to be widely and inexpensively available in a variety of forms, and if IBOC DAB is incapable of meeting this requirement, that is just another stumbling block for it and another advantage of existing radio technologies.

Kevin M. Tekel, N2WTO  
14 Cambridge Drive  
Warren, NJ 07059-6903  
kevtronics@yahoo.com  
FCC-Licensed Amateur Radio Operator

Webmaster of The AM Stereo Web Site  
<http://www.AMStereoRadio.com/>